§5. Video on Demand Server System for Distributing Plasma Moving Pictures for LHD Plasma Discharge Experiments

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Plasma image data measured with a tangentially viewing CCD camera (7-T) have been useful for monitoring plasma dynamic behavior and plasma wall interactions in real-time. For safe plasma discharge operation in LHD, we constructed a Video On Demand (VOD) server system to distribute the plasma moving pictures to operator's PCs. Figure 1 illustrates the shcematic picture of the VOD server system. A video signal (NTSC) from the CCD camera is received by an encoder board (FutureTel, PrimeView Duet) installed in a standard PC (Logitech ATX series, Windows NT workstation). The encoder can compress the video signal by a moving picture compression format (MPEG-1). The moving pictures of an LHD plasma were successfully compressed without observable deterioration of the image quality. The encoder makes an MPEG-1 formatted video file after every plasma discharge, and immediately transfers the file to the VOD server system by TCP/IP network connection via a firewall system.

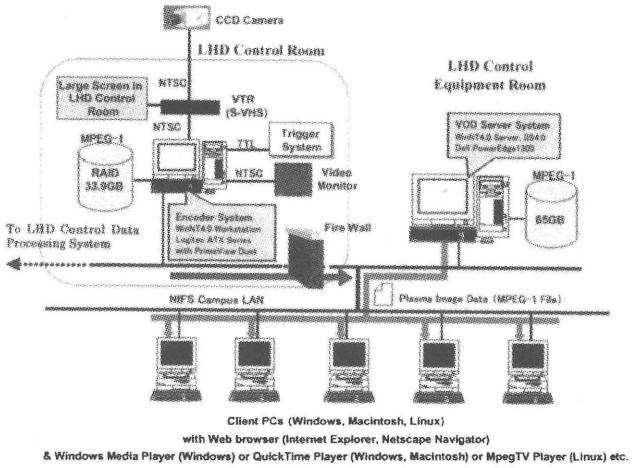

Fig.1. Schematic picture showing the Video On Demand (VOD) server system for distributing plasma moving pictures for LHD plasma discharge operation.

The VOD server system (Dell PowerEdge1300, Windows NT server) is located on a NIFS campus LAN. We introduced the Microsoft Internet Information Service (IIS4.0) and used the windows Active Server Pages (ASP) technology, which contributes the flexible image data access from multi-platform client PCs (Windows, Macintosh, and Linux etc.) with the free video player applications and Web browsers (Microsoft Internet Explorer or Netscape Navigator). The video contents on the server are automatically updated after every plasma discharge.

Figure 2 shows the view of a Web page on the VOD server (http://cdpvods1.lhd.nifs.ac.jp). We can search an MPEG file by specifying the plasma discharge number or the date of the plasma experiment, and also easily access the newest data of plasma moving pictures by the ASP technology which is a server side script written by VBscript. We can immediately investigate and monitor the plasma dynamic behavior by driving the MPEG file on free video player applications on the Web browser. In addition to the experimental results measured with LHD plasma diagnostics, the VOD server system routinely contributes to the optimization of the experimental configuration of LHD plasma discharges.

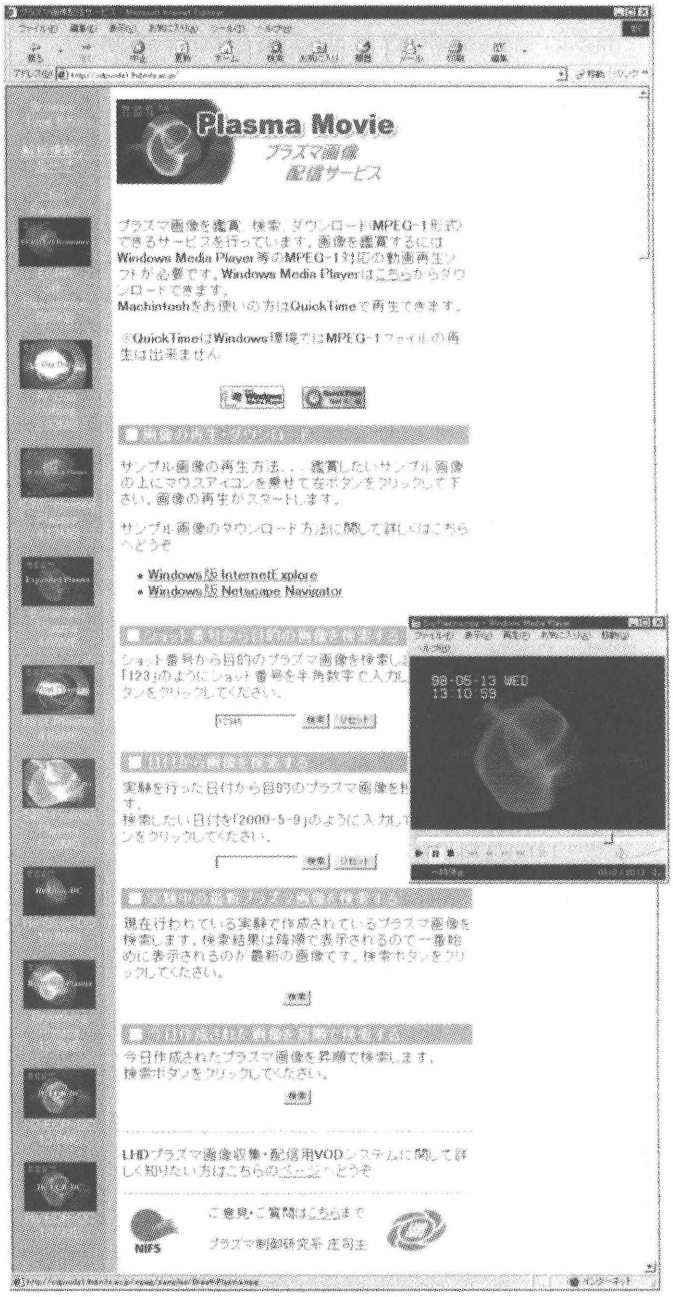

Fig.2. The view of a Web page on the VOD server system for distributing MPEG formatted LHD plasma moving pictures.